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TEXTILE CONDITIONS IN AMERICA.

By WILLIAM DAVIS, M.A. (Edin.), Hawick.

HAVING recently undertaken an extensive tour through the textile manufacturing centres of the United States of America, I am pleased to have this opportunity of recording some observations made during the course of my investigations. In doing so it will be instructive to compare conditions as they exist in Britain with those of America, and to endeavour to trace the causes of certain developments. America being, comparatively speaking, a new country, it has had the advantage of the accumulated experience of older countries, and has been many times in the happy position of starting at an advanced stage of development without being hampered by the vestige of stages which are past. In Britain the industries have gradually evolved from a state of crude hand labour to the present stage of mechanical progress. The various industries have in many instances been native to the district for generations, with the result that the skill has also been transmitted, and you have in such communities a large proportion of workers whose settled purpose it is to devote their lives to one or other of the branches of textile manufacture. With this the various divisions of the trade are being more and more specialised, and the lines of demarkation are becoming ever more clearly defined, so that a community can concentrate its various avenues of effort on excelling in some special section of the industry. In contrast to this the American nation is made up of fragments of every other nation, and so does not possess the uniform characteristics just referred to. A continuous stream of emigrants proceeds hither, and the country at once begins to absorb these elements. The source from which the emigrants come is determined to a certain extent by industrial conditions. In the early days of the textile industry the operators were drawn from the British people, but as the industry expanded these moved upwards in the scale, and the French-Canadians were called in to fill the inferior places. Succeeding them operators had to be drawn from every European country, the tide proceeding ever westward. In succession they have attracted large numbers of Portuguese, Belgians, Germans, Poles, Italians, Roumanians, Greeks, and among the more recent additions have been Syrians from Palestine. Now the advent of increasing numbers of operatives from Southern Europe creates the difficulty of language, so that they cannot be instructed in the finer points of their work. They are also to a large extent unskilled, and can therefore only be entrusted with one particular operation restricted in its scope. This in part has led to the fine sub-division of labour in American textile factories; one worker learns one operation and performs this until considerable skill is acquired. As these people are drawn

from countries where liberty has to be asserted by recourse to the knife, overseers require in a high degree the ability to control men so as to subdue such tendencies. They must exert a civilising influence.

I examined some figures showing the proportion of different nationalities employed in a large cotton mill, and it was highly interesting to note how each race seemed to occupy the department for which they had been found best adapted. The bales were opened by the Syrians, Greeks were employed in the card rooms, the roving frames had for attendants the middle-aged Irish, the spinning and weaving was performed by French-Canadians and Belgians, whilst Italians and Poles were found most useful in the dye-houses. The overseers' positions, it is pleasing to observe, were occupied by native Americans or British who had emigrated early. As the representatives of those nationalities just mentioned have little or no sense of attachment to any particular locality or business, they move frequently from one district to another; the floating population is immense, and this naturally causes great trouble to the manufacturer. He has, however, himself to blame in a certain degree because of the readiness with which he dismisses workers when trade shows signs of being dull; he also frequently shuts his mill altogether for a given period, with the result that his operators go elsewhere, and he is obliged to gather a fresh staff for a new start.

The textile industries in the United States have ever since their inception been hampered through lack of help, and the manufacturer has been driven to expect the maximum from the labour at his command. It has also stimulated invention, especially in the direction of labour-saving devices. Being far from the base of operations and the sources of machine supply in the old country, he has been forced to erect for himself. This question of distance has prevented the British makers from understanding his peculiar requirements, and they have developed machine mechanism suitable for their own needs. A notable example of this is found in the machine for making articles of hose. The American public demands an article of much finer gauge than the British, and this has determined the course of development in machine construction.

Being particularly interested in the organisation of woollen and worsted factories, I desire to make special reference to them. There exists in the States a division between woollen and worsted which is rather difficult to understand. Trade controversies frequently resolve themselves into woollen *versus* worsted, and have even a political significance. The worsted manufacturers are strongly organised, and represent many of the largest corporations. The woollen manufacturers have their factories more scattered, and represent much smaller concerns. This is given as one of the reasons of the partiality of the American for worsted clothing, whilst another is said to be the fact that the duty on imported wool is on specific weight and not the value or *ad valorem*. As the wools suited for woollen goods usually lose in scouring a much

higher percentage of weight than wools suited for worsted goods, the woollen manufacturer is at a disadvantage. Be that as it may, one is struck by the general low quality of the woollen goods manufactured in the States, the products of a very few firms excepted. As the public has been taught to expect an inferior standard in woollens, it has naturally turned to worsteds, where the standard is much higher. The few firms in the States which manufacture high grade woollens are run on "old country lines" and by old country men.

Another result of such well-organised industry as that of the worsted industry is that they have a much better control of the market and can have an important influence in deciding the kind of goods which are to be placed before the public for the new season. The making of experimental pattern ranges is not carried to anything like the same extent as in Britain, and even those made are not placed directly before the buyer. The New York agents and the mill men meet and decide which styles are the most likely to sell, and the number is reduced to comparatively few. Thus there is a great reduction effected in the cost of pattern making, and much longer warps can be procured, reducing the cost of production considerably. The custom of buying pattern styles is very prevalent, and a number of men follow this pursuit exclusively. It appears that Canada is a fruitful source of supply. Most of the British firms send the newest selections to their agents, who at the end of the season dispose of them to the pattern jobber, who in turn sells them to the factories.

Although it is pretty evident that the British manufacturer, by his patterns, gives the American many ideas for style, yet it is scarcely correct to say that they closely copy British designs. A casual observer notices that the styles for men's wear are totally different. The summers are warmer, and in winter the houses are heated persistently to a high temperature, so that the weight of cloth is considerably less than in Britain. Our summer weight constitutes their winter texture, whilst their summer cloth is much lighter than is usual with us. To attain this result the designer has to work on totally different schemes of cloth structure. This tendency towards light weight is further accentuated by the loose style of clothing worn. The American has an aversion to anything with much surface fibre; the face is cut closely, the cloth somewhat crisp in handle, and inclined to be hard. Owing to the wide diversity of nationalities, the manufacturer has to cater for a variety of tastes. One broad division exists between the east and west, the latter demanding more pronounced twills and contrasting colourings than the former. The tendency of the east is to approach the styles of British taste with quiet harmonies and refined style. The westerner, on the other hand, demands louder and more showy effects, and amongst his fabrics may be seen designs and colouring considered to belong to past stages of British taste.

As the chief centres of distribution are removed hundreds of miles from each other, the methods adopted are rather different

from ours. It is customary to entrust this to commission houses, which frequently control the business of several large firms. When they receive orders they decide which of their firms can best execute same, and deliver accordingly. With the increase of competition of one firm with another, this system is becoming somewhat less prevalent, as they find it more satisfactory to have their own agents at the selling centres. All concerns have their representatives in New York located in the most handsome suites of offices to be found in the world. The high buildings have usually 15 to 20 storeys, so that it is possible to concentrate an immense business population within a limited area. I visited the headquarters of a large textile corporation, and was particularly struck by its attractiveness. Rapid conveyance to any floor is effected by the lifts, of which there are two kinds, those which stop at every floor, and those which are express for 12 or so. The showrooms proper do not begin till about the eighth floor, so that an unobstructed light is available. The goods are classified into various departments, and the patterns can be examined on tables adjustable to any angle. Small rooms are set apart for conversation with buyers, and other rooms for their personal convenience. In fact everything is done to make this part of the business as attractive as possible.

In considering the equipment and organisation of textile factories we have two very distinct classes—(a) those of the large corporations, which includes in one instance 33 large individual factories, and (b) the smaller concerns controlled by several individuals. In the case of the American Woollen Company, huge factories have been erected within the past few years, equipped to give employment to six or seven thousand workers, and in their construction everything that experience can devise has been embodied. Situated right at the river side, the stream is diverted to provide the driving power, which is in every case electricity. The driving of frames and looms with individual motors is common, and large sheds are found without any overhead shafting. The lighting and ventilation are ideal. I was particularly struck by the condition of the dye-houses in that the steam was drawn immediately through the roof, and the air was as clear as that in any other department. The turning shops also were everywhere equipped with suction apparatus for the removal of dust and chips from the machines. There were also abundant evidences of a close application of chemistry to textile processes, the most remarkable of which was a magnificent and elaborate equipment for extracting yolk from wool by the naphtha process. They had also a chemist engaged to find commercial uses for the ultimate constituents of yolk. The loom equipment is remarkable for its extreme uniformity, and is confined to a few leading types, *i.e.*, the ordinary tappet and Northrop for cottons, whilst for woollens and worsteds the Dobbross is practically universal. The warp stop motion is frequently put on to the latter to increase the number of looms operated by one weaver. For the same reason the automatic shuttle filler has been adapted to the heavy woollen

loom, and that to operate successfully as many as four colours. In the cotton factories were noticed many automatic knotting machines, which had taken the place of hand twisting, and could knot an average cotton beam in a few minutes. In spinning I was particularly struck by the readiness with which many firms have taken up the French method of worsted spinning, and of the increasing favour with which it is regarded for producing yarns specially suited for costume cloths.

Various branches of the textile industry show a tendency to gravitate into their respective centres. Fall River has the cotton mills in predominance, the woollen and worsted industry is concentrated round Lawrence district, whilst the bulk of the knitting industry is found in various towns in New York State, such as Utica and Cohos. Philadelphia is a textile city, where every branch is represented. The divisions are not so clearly marked as in Britain, isolated factories are numerous, and one can frequently find a number of distinct classes of goods being manufactured by the same firm on the same premises. This is perhaps the reason why so many men are found with an extremely varied experience. I met overseers who had had experience in silk, cotton, woollen, and worsted goods. They regard it as essential to have a wide experience, and they frequently move from one firm to another. In one instance I noted a case where a superintendent of recognised ability had never averaged more than three years with one firm. This continual moving round amongst the overseers and superintendents is minutely recorded by the technical journals, and gives a personal interest to their perusal.

The conditions just mentioned are reflected in the system of textile education which has developed in America. Well-equipped schools have been established in the leading textile cities, and these are remarkable for the variety of branches represented. The training is much more general than is the case in Britain, and great stress is laid on the ability of the students to give concrete expression to all instruction. "We learn by doing" is the principle employed, and we find that there is developed in the students marked facility in this direction. Perhaps this has been at the expense of the theoretical, for one is disappointed to find such small evidence of research work concerning textile problems. Up to the present the textile instruction has been best adapted to the needs of those who are to be manufacturers or occupy the leading positions in the industry. Now there is a widespread movement in favour of what is termed "mass education," whereby the instruction is adapted to the needs of the worker with a view to increasing his efficiency. This has arisen from the need which is felt for more skilled operators in all branches. Owing to the cosmopolitan nature of the workers and their lack of persistence in one industrial pursuit, the problem is admittedly one very difficult to solve.

DISCUSSION.

MR. OSCAR S. HALL (Bury) opened the discussion, and said: I have had some experience of conditions in the United States, and it has been forcibly brought to my mind that we have nothing to fear from American competition on the lines that Americans are working. I consider they have been a much over-advertised nation in regard to business capacity. We are always being told that they go in for the most up-to-date machinery, but I have been astonished at the large quantity of old machinery at work in the country and at the money spent on altering this old machinery, which, when altered, could not run as quickly as the modern machinery now used in this country for the same purpose. We do not find that generation after generation remain at the same trade, consequently there is a lack of that adeptness for textile work which is, as it were, born into Lancashire textile operatives. I think Mr. Davis has done a service to the Textile Institute in bringing us a resumé of the general trade conditions in the United States.

MR. MYERS (Manchester) said: I am inclined to believe with Mr. Hall that the Americans are not all they are represented to be. My impression when I visited the States a few years ago was that the quality of work was not so high as in England, especially in the cotton trade. I saw goods in process of manufacture and finishing, and I am certain that a fair proportion of them could not have been sold in this country. They have, as you know, a closed market, and that, I think, is not conducive to the best work. I do not know much about division of labour in the woollen and worsted industry, but as regards the cotton industry I do not think the division of labour is carried to a fuller extent in America than in England. Mr. Davis makes mention of the flotation of the people, with which I agree, but there are some cities in which this condition is changing; for instance, in Fall River and New Bedford they have a more settled population engaged in the production of finer style of goods than formerly. Regarding the variety of goods produced in an American mill, it will be found to be less than in an average Lancashire mill. You will find American mills almost solely engaged on a 16 square "shade" cloth, whilst in Lancashire the varieties would be more numerous.

MR. HEYLIN (Manchester) said: I agree with a good deal that has been said by Mr. Myers. I was in America at the same time as he, and I had the opportunity of studying the cotton industry there. I have no great opinion of American labour. Mr. Davis says there are not many ideas carried out as regards designs in the woollen trade, and that the ideas are somewhat different from British. But in the cotton trade their ideas are pretty much the same as in Lancashire, especially in finer shirtings, in zephyr cloth, also in the finer muslins and figured lenos. I went into a cotton

mill with over 2,000 looms, and I was informed that they had not a designer in the place; they simply "got a man" who did the "picking," and they "picked" the designs from England. With regard to the capability of overseers, I was not particularly struck. I asked one assistant superintendent how long he had been there. "Only a matter of three years," he said. "I expect you have had experience elsewhere," I said. "Oh, I guess not," was the reply; "before that I was an insurance agent." I spoke to another manager who could not tell me how many ring spindles an operative attended to, and he did not know the wages of the workpeople. I had heard so much about the enterprise of American millowners that I was surprised to find a mill was on 32's twist and 36's weft, and the looms were all engaged with one kind of cloth.

MR. DAVIS replied, and said: Regarding the equipment of textile machinery, my remarks refer more especially to large corporations in the United States. I agree that there is to be found much machinery that is out of date, but I found that that was mostly the case in isolated factories, as well as in some places in Canada, where they were very much behind. But in production, the first consideration with Americans is quantity, with the result that their products are distinctly uniform. You would find in America very little variety in types of clothing. I found that those who went in for variety always purchased what were known as imported goods. However, American manufacturers are endeavouring to procure a more steady factory population; they are finding that the constant moving of the people from place to place and factory to factory is detrimental to their interests. Regarding designs, I may say that my remarks refer especially to woollen and worsted trades.